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Title : Climate change and the Baltic ringed seal (Phoca hispida botnica) - Using ice cover simulations to study the impact of the global warming on the Baltic seals

Category : Ecology

Student : Not Applicable

Preferred Format : Poster Presentation

Abstract : Global warming is expected to have a considerable influence on the seasonal Baltic Sea ice cover. The grey seal and the Baltic ringed seal use ice as their primary breeding habitat. The grey seal can also breed succesfully on land, but the ringed seal is dependent on ice for breeding.

The winter distribution of the ringed seal is concentrated in areas with dense fast and pack ice. There are three distinct breeding areas: The Gulf of Riga, the eastern part of the Gulf of Finland, and the Bothnian Bay. Breeding is also known to occur in the southwestern archipelago of Finland. The breeding areas can be considered as separate populations.

We used future (2071-2100) ice cover simulated with the GCM-driven regional Rossby Centre climate model RCAO to study the effects of global warming on the ice cover of the present breeding areas. Two global models (HadAM3H, ECHAM4) and two scenarios (IPCC SRES A2 and B2) were used.

The ice cover period is drastically reduced in all of the breeding areas, with ice cover lasting less than half the current average period in southern ones. In the future only the northern Bothnian Bay will have a mean ice period exceeding two months. Succesful breeding of the Baltic ringed seal will in most years probably be possible only in the northernmost Baltic sea region.

The extinction probability of the breeding populations will be studied more closely using ecological risk analysis. Important parameters of the model are the interannual variation in the length of the ice period, and pup mortality estimates.